Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims:

Claim 1 (Original) An azetidinium functionalised polymer containing secondary amine groups.

Claim 2 (Original) An azetidinium functionalised polymer according to claim 1 of which the monomers comprise:

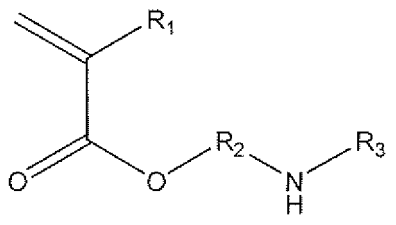
a) an amino-acrylate and/or amino-alkacrylate monomer, and,

b) optionally, further non-amino acrylate and/or alkacrylate monomers.

Claim 3 (Previously Presented) A textile treatment composition which comprises a polymer in accordance with claim 1 and a textile compatible carrier.

Claim 4 (Original) A textile treatment composition according to claim 3 wherein the concentration of the polymer is such as to give 0.01-1%wt on weight of textile material being treated.

Claim 5 (Original) A polymer according to claim 2 wherein the amine containing acrylate monomers have the general structure:



wherein

R_1 is hydrogen or a C_1-C_6 alkyl,

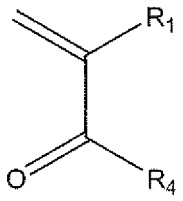
R_2 is C_1-C_6, alkyl, alkoxy or repeating units thereof,

and,

R_3 is hydrogen or C_1-C_6 alkyl, alkoxy or repeating units thereof.

Claim 6 (Currently Amended) A polymer according to claim ~~5~~ 2 wherein the amine containing acrylate monomers include one or more of 2-Aminoethyl methacrylate, and, 2-(tert-butylamino)ethyl methacrylate.

Claim 7 (Original) A polymer according to claim 2 wherein the non-amino acrylate and/or alkacrylate monomers are of the general formula:



where:

R_1 is hydrogen or a C_1-C_6 alkyl, alkoxy or repeat units thereof,

R_4 is a functional group does not contain an amine.

Claim 8 (New) A polymer according to claim 7 wherein R_4 is a polyalkyleneglycol.

Claim 9 (New) A polymer according to claim 8 wherein the non-amino monomer is one or more of

poly(ethyleneglycol)methacrylate, poly(propyleneglycol)methacrylate,
poly(ethyleneglycol)acrylate, and,
poly(propylene glycol)acrylate.

Claim 10 (New) A polymer according to claim 7 wherein R_4 is poly(dialkyl siloxane) or poly(alklene glycol) fatty ether.

Claim 11 (New) A polymer according to claim 7 wherein R_4 is one or more of one or more of:

2,2,3,3,4,4,5,5-Octafluoropentyl acrylate,
2,2,3,3,4,4,5,5-Octafluoropentyl methacrylate,
2,2,3,3,4,4-Hexafluorobutyl acrylate,
2,2,3,3,4,4-Hexafluorobutyl methacrylate,
1,1,3,3,5,5-Hexafluoroisopropyl acrylate, and,
1,1,3,3,5,5-Hexafluoroisopropyl methacrylate.

REMARKS

Reconsideration and withdrawal of the examiner's rejections under 35 USC § 102 are respectfully requested in view of the above amendments and the following remarks. The applicant would like to thank the examiner for his kind cooperation in this matter.

35 USC § 102

The examiner has rejected claims 1, 3 and 4 under 35 U.S.C. § 102(b) as being anticipated by Parker (WO 01/25386). The examiner asserts the following:

The prior art of Parker teaches fabric care compositions comprising reactive cationic polymers, specifically secondary amine based azetidinium resins, and textile compatible carriers (page 4, lines 15-21; page 5, lines 10-28; page 6, 17-19) as claimed in claims 1 and 3. Parker further teaches the resins be applied at 0.0005-5% by weight on the fabric based on the weight of fabric (page 7, lines 5-11), as claimed in claim 4.

Accordingly, the teachings of Parker anticipate the material limitations of the instant claims. Applicants respectfully traverse this rejection.

WO 01/25386 discloses fabric care compositions adapted for use in a domestic laundering process, comprising at least one reactive cationic polymer, at least one reactive anionic polymer, and at least one textile compatible carrier. The cationic polymer disclosed is a secondary amine based azetidinium resin as opposed to a azetidinium resin having intact secondary amine groups. The resin is formed by the functionalisation of a polyamine (in this case secondary amines) with epichlorohydrin and has the cationic structure shown on page 6 of WO 01/25386. Such resins are discussed in the instant specification at page 1 line 30 – page 2, line 12. The secondary amine group is 'used up' on reaction with the epichlorohydrin to provide the azetidinium group, hence there will not be a polymer with secondary amine groups

+ azetidinium groups. There is no disclosure in Parker et al., of an azetidinium functionalised polymer containing secondary amine groups (i.e. a polymer with azetidinium groups in combination with separate secondary amine groups). Therefore current independent claim 1 is novel over WO 01/25386.

Furthermore, regarding the surprising advantage of the current invention in respect of WO 01/25386, the resins of Parker et al., will still exhibit the problems stated in the instant case. This is because the azetidinium group will only crosslink with itself (via the tertiary gamma chlorohydrin as shown on page 4 of the instant case), producing a quaternary cationic group, i.e. maintaining the positive charge. Therefore the crosslinked species will have a positive charge that will make them attract soil (or dyestuffs) when used during a fabric treatment process. The inventive polymers have additional secondary amines along with the azetidinium functionalised amines, so that crosslinking can occur without the formation of a cationic center and thus avoid the aforementioned disadvantages.

The examiner has rejected claims 1, 2 and 5-7 under 35 U.S.C. § 102(b) as being anticipated by Swarup, et al. (WO 93/13142). The examiner asserts the following:

The prior art of Swarup, et al., teaches polymers such as acrylics modified by azetidinol containing materials (page 2, lines 28-30), specifically polymers comprising monomer mixtures of tertiary-butylaminoethyl methacrylate and ethyl methacrylate (page 3, lines 32-35; page 4, lines 11 and 14), as claimed in claims 1, 2 and 5-7. Accordingly, the teachings of Swarup, et al. anticipate the material limitations of the instant claims. Applicants respectfully traverse this rejection.

Swarup, et al., discloses an ungelled reaction product prepared from a carboxylic acid group containing polymeric material and an azetidinol containing material having one azetidinol

moiety per molecule. The document explains the formation of the ungelled reaction product through three main process steps. See below figures.

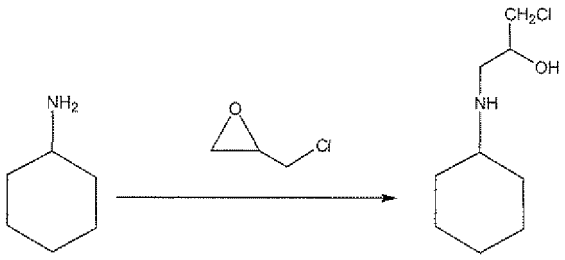
Step 1, is the formation of the azetidinol, this is the reaction of cyclohexylamine and epichlorohydrin (page 6, lines 31-33).

Step 2 is the formation of the carboxylic acid containing polymeric material from a possible variety of monomers.

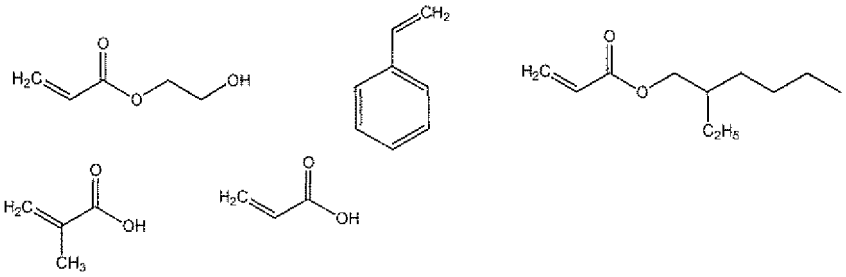
Step 3 is the reaction of the products of steps 1 and the polymer of step 2 (page 7, line 23 onwards). A covalent bond is formed wherein the chloro group is substituted for the carboxylic acid of the polymer.

The product of step 1 contains azetidinium/azetidinol groups, but is not a polymer. The product of step 2 is a polymer but contains no azetidinium/azetidinol groups and the product of step 3 is a polymer, but contains no azetidinium/azetidinol groups as they used up in the formation of the step 3 product.

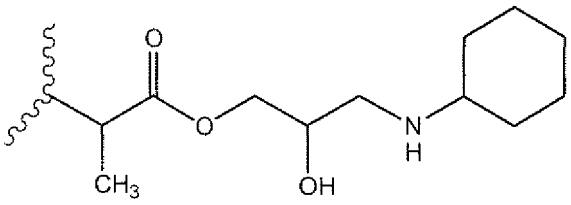
WO 93/13142 stage 1



WO 93/13142 stage 2– identity of polymers



WO 93/13142 stage 3 – product formed



The product of Swarup, et al., is ungelled, which shows that self crosslinking (gelling) cannot occur. This indicates that the reaction product does not contain any azetidinium groups, as if it did, it would undergo self-crosslinking. This is further indicated by page 7, lines 29-32 of Swarup et al., where it is stated that all of the azetidinol groups are consumed.

The cited parts of WO 93/13142 (page 2, lines 28-30) only show that according to Swarup, et al., acrylics are modified with azetidinol containing materials having one azetidinol moiety per molecule. In fact it is the azetidinium group itself that reacts with the carboxylic acid polymeric material, the reactive chlorine is used up in the reaction, and so no azetidinium group remain in the reaction product. It is respectfully submitted that Swarup et al., does not

show that the final reaction product is an azetidinium functionalised polymer containing secondary amine groups.

Therefore the disclosure of Swarup et al., does not anticipate or suggest current claim 1.

Moreover, neither Parker, et al., or Swarup, et al., singly or in combination teaches or suggests at an azetidinium functionalised polymer containing secondary amine groups. The disadvantages of the prior art azetidinium groups in laundry use (the formation of permanent cationic groups) are surprisingly overcome by the present invention by incorporating secondary amine sites into the finished azetidinium polymer so that crosslinking can occur without the formation of a cationic center.

CONCLUSION

In summary, claim 6 has been amended and claims 8-11 have been added. With respect to the amendment, new claims 8-11 have been added back to the case since they were inadvertently cancelled earlier. Claim 6 is also amended to correct an antecedent basis issue. No new matter has been added by way of this amendment.

In light of the above amendments and remarks, applicants submit that all claims now pending in the present application are in condition for allowance. Reconsideration and allowance of the application is respectfully requested. The examiner is invited to contact the undersigned if there are any questions concerning the case.

Respectfully submitted,

Alan A. Bornstein
Registration No. 40,919
Attorney for Applicant(s)

AAB/ss
(201) 894-2180